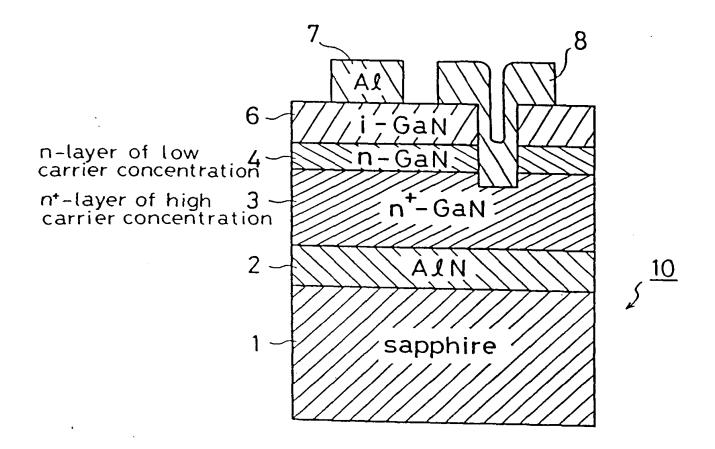
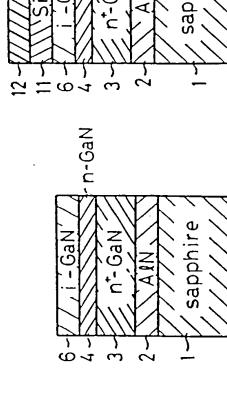
FIG.1





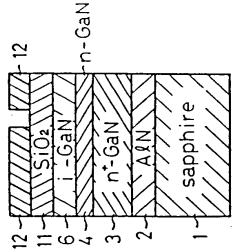
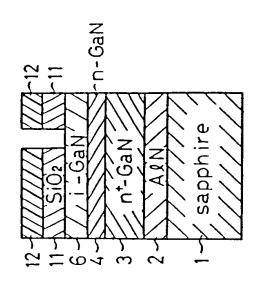
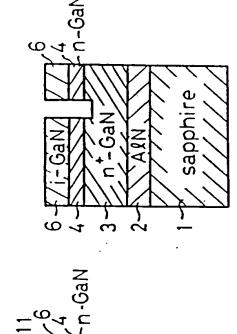


FIG.6

F1G. 5

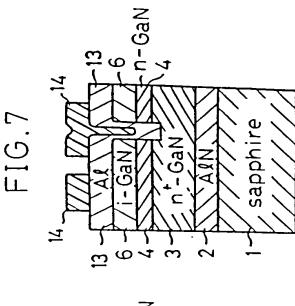
Si0<sub>2</sub>





<sup>±</sup>GaN

sapphire



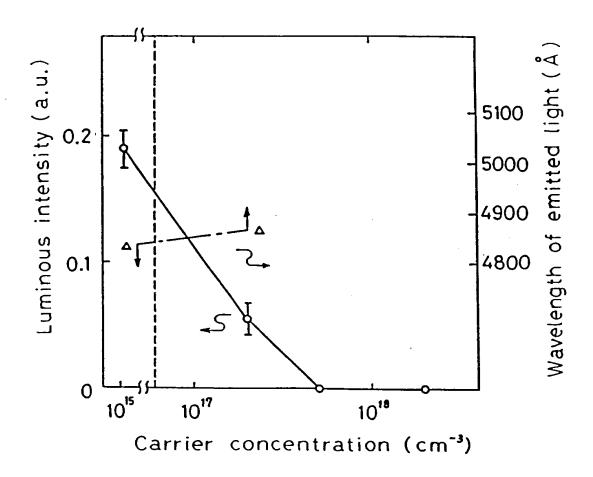


FIG. 9

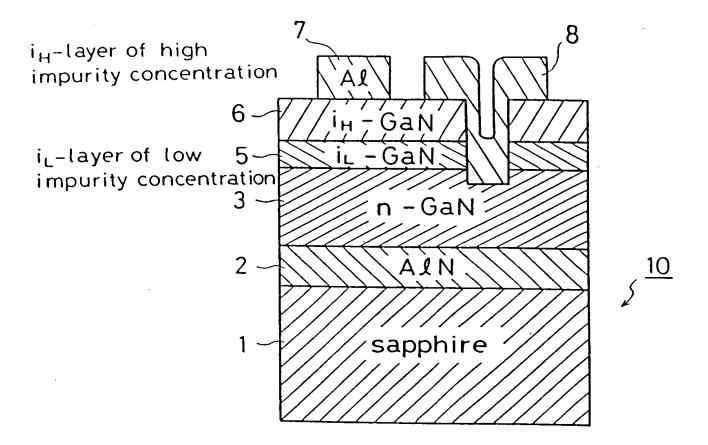
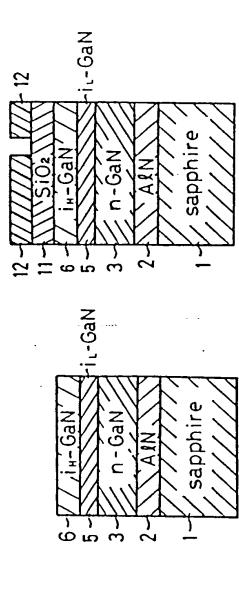
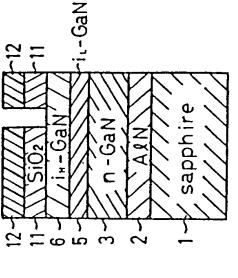


FIG.10

FIG. 11

FIG.12





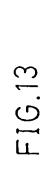
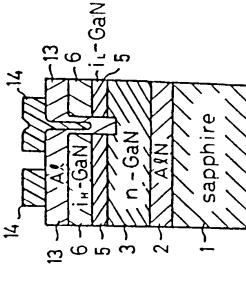
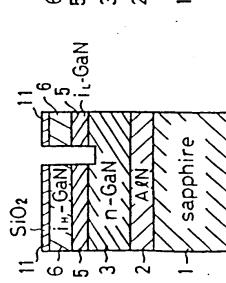
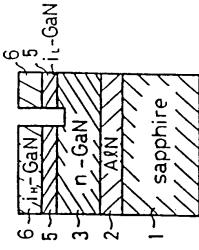




FIG.15







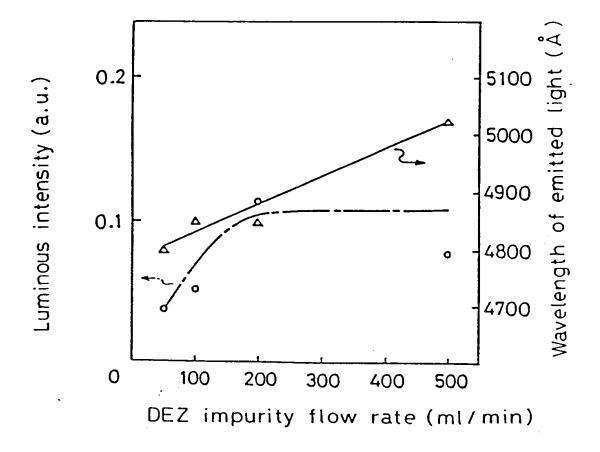
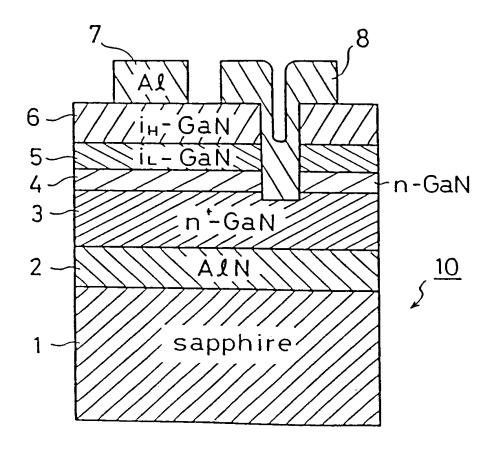
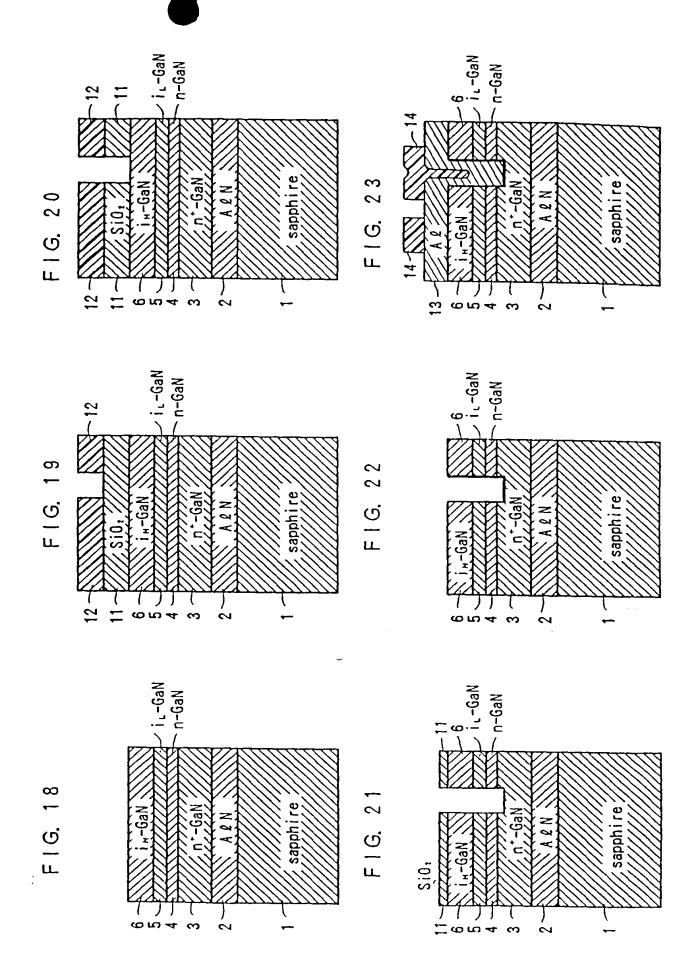


FIG. 17



. .



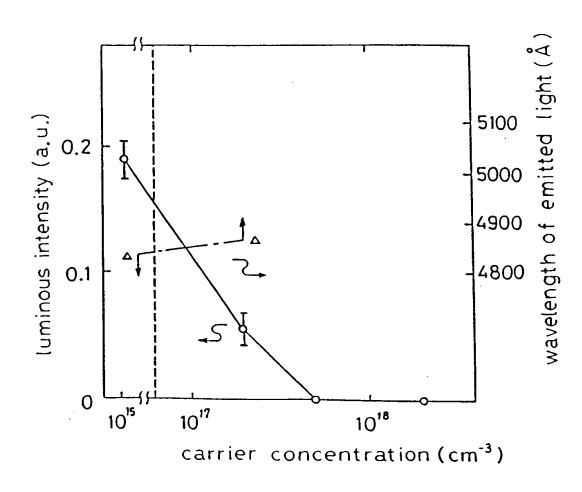
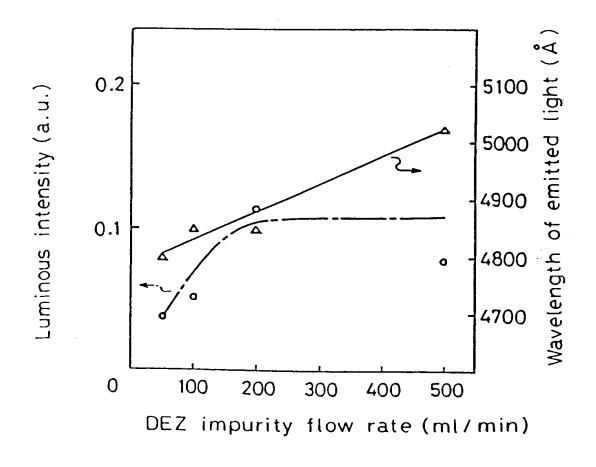


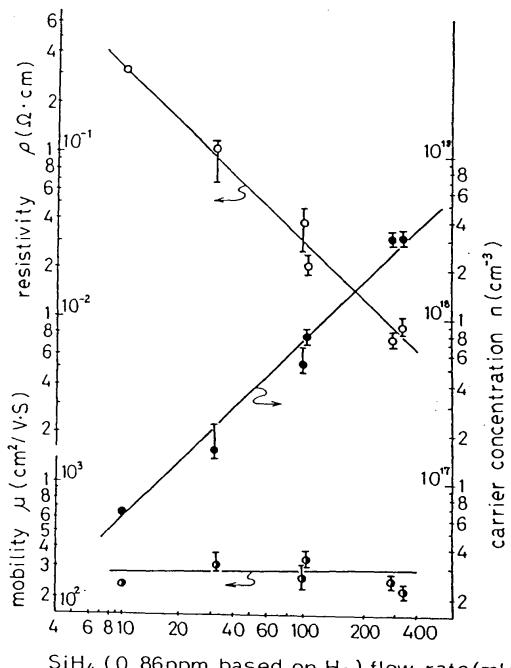
FIG. 25





• : carrier concentration

• : mobility o : resistivity



 $SiH_4$  (0.86ppm based on  $H_2$ ) flow rate(ml/min)